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BETATECH
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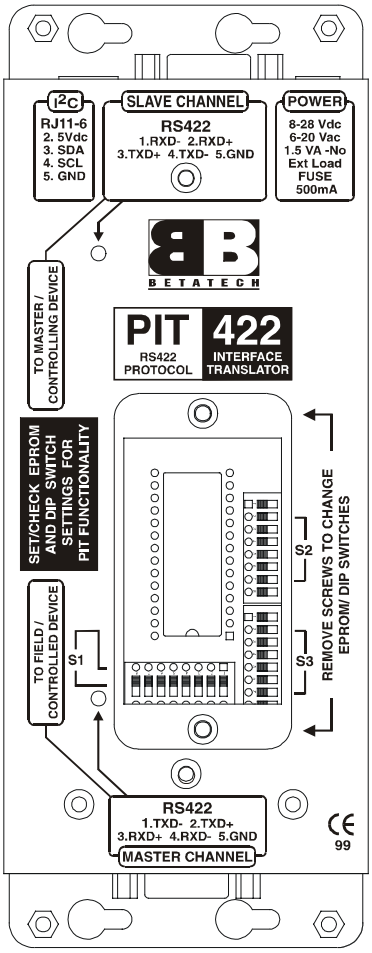
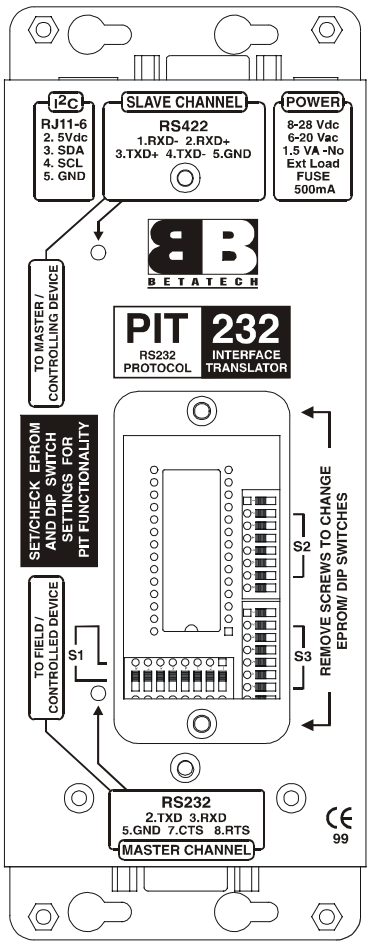
PROTOCOL INTERFACE TRANSLATOR (PIT) USER MANUAL





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LIST OF ABBREVIATIONS

LED	-	Light Emitting Diode
PIT	-	Protocol Interface Translator
PTZ	-	Pan / Tilt / Zoom

1. INTRODUCTION

The Betatech Protocol Interface Translator converts Betatech's BossWare serial command protocol, to various protocols compatible with equipment from other manufacturers.

The PIT has two serial communications ports. The RS422 / RS485 "Slave" port connects to the BossWare communications loop and interprets the telemetry control messages. The RS422 / RS485 or RS232 "Master" port connects to the other manufacturer's equipment.

The PIT may be configured to operate in various modes:

- In PTZ mode, the BossWare PTZ control messages are received on the "Slave" communications port. Dependent on the DIP switch settings, these commands are then translated to serial data packets which are compatible with other manufacturer's Pan / Tilt / Zoom telemetry receivers or integrated domes.
- In device control mode, generic BossWare device control commands are received and translated into data packets compatible with other manufacturer's VCR's, Multiplexers, Quad's and the like.
- In Alarm Concentrator mode, alarm inputs and system outputs may be connected via the I^2C expansion port on the PIT. This allows for the connection of up to 256 remote alarms into a system and also for up to 256 system outputs. In device control mode, the PIT receives generic device control commands from the system main controller.

2. OPERATION

On power up, both the slave channel and the master channel LEDs, will be illuminated.

The PIT unit receives serial messages from the system master controller, via it's slave communication port. When a valid message is received, the slave port LED will flash off briefly to indicate message receipt. Only messages addressed to the unit address set up on DIP switch 2 will be received. Should DIP switch 2 be set to zero (all switches off), then messages addressed to any PTZ unit will be received by the PIT. The received PTZ control message will then be translated into the appropriate command, compatible with the PTZ equipment selected by means of DIP switch 3. This message will be transmitted out of the master port to one or more PTZ telemetry receivers / domes which may be attached to this port. When the message is transmitted, the master port LED will flash off briefly.

When the PTZ unit does not support addressing (e.g. Mitsubishi RS232 camera), then one PIT is required per PTZ and the various PTZ units in a system may be individually controlled by setting the address switch on the PIT. When the PTZ unit supports addressing (e.g. VCL domes), then the PIT may be set to address zero (broadcast) and each PTZ unit on the master communication port must be set to a unique address. There is no limitation in mixing PTZ units / domes from different manufacturers as long as the above requirements are met and there is at least one PIT per translation type.

Should an installation require one or more PIT units for protocol translation, this has no effect on the connection / operation of standard PTZ units, which are compatible with the "native" RS422 protocol generated by the master controller.

Should it be required to use features such as auto-homing, only on specific PTZ units, then these units must be attached to a PIT which is set up for the required features. Other PTZ units which do not require this feature must be attached to the master port of a separate PIT, which has this feature disabled. In such a system, each PTZ unit must be at a unique address in order for the master controller to be able to control it independently.

The PIT takes care of translating fixed speed commands into variable speed commands, which are automatically ramped from slow to high speed, when the PTZ unit supports variable speed. Similarly, variable speed commands are translated into fixed speed commands where the PTZ unit does not support variable speed.

The PIT allows for I^2C alarm input expansion modules to call preset positions on attached PTZ units. The I^2C unit set to address 8, causes PTZ 1 to move to preset positions 1 to 16 when the corresponding inputs are activated by the closing of an external contact. I^2C expansion unit address 9 operates PTZ 2 etc. I^2C expansion unit address 16 operates PTZ 8, allowing for a maximum of 8 PTZ units to be controlled by the I^2C expansion modules in this manner.

3. SWITCH SETTINGS

To access the configuration switches, the two screws on the top cover of the PIT must be removed. The legend on the cover shows the switches as S1, S2 and S3. Each of these switch groups has 8 individual switches, marked as 1 through 8. Individual switches are referred to by the switch group, followed by the switch number. e.g. S1/8.

3.1. Address Selection

Set switch 2, to the required address of the PIT. This would usually match the camera number in the system. The actual switch setting is the binary representation of the address. Certain protocols allow for the addressing of multiple devices on the master communications port (Broadcast mode). In this case, This DIP switch may be set to address zero, which will pass all received messages through from the slave to the master port. The following table shows the first few addresses:

Address	S2/8	S2/7	S2/6	S2/5	S2/4	S2/3	S2/2	S2/1
Switch Legend	Address 7	Address 6	Address 5	Address 4	Address 3	Address 2	Address 1	Address 0
0 (B/cast)	off	off	off	off	Off	Off	off	off
1	off	off	off	off	Off	Off	off	on
2	off	off	off	off	Off	Off	on	off
3	off	off	off	off	Off	Off	on	on
4	off	off	off	off	Off	on	off	off
5	off	off	off	off	Off	on	off	on
6	off	off	off	off	Off	on	on	off
…								
255	on	on	on	on	On	on	on	on

There is one exception to input protocol. When the input address is set to 255, the PIT will receive 8 bit data and operate in broadcast mode.

3.2. Baud Rate Selection

Switch 3, positions 7 and 8 are used to set the slave port baud rate as per the following table:

Baud Rate	S3/8	S3/7
1200 baud	off	off
9600 Baud	off	on
19.2 Kbaud	on	off
57.6 Kbaud	on	on

3.3. Input Protocol Selection

Switch 3, positions 1 to 4 are used to set the protocol which the PIT expects to receive on it's slave communications port.

Input / Received Protocol Compatible With	S3/4	S3/3	S3/2	S3/1
Reserved	Off	Off	off	off
BossWare (first group)	Off	Off	off	on
BossWare (second group)	Off	Off	On	Off
Reserved	Off	Off	on	off
Reserved, binary values 3 to 14				
Device Control Interface	On	On	on	Off
Alarm Concentrator	On	On	on	on

3.4. Output Protocol Selection

Switch 1, positions 1 to 4 are used to set the protocol which the PIT will transmit on it's master communications channel.

Note that the group selection must be carried out as described under "Input Protocol Selection".

Output / Transmitted Protocol Compatible With	Group	S1/4	S1/3	S1/2	S1/1
Text / diagnosis output	First	off	Off	off	off
Betatech / GYYR Vortex	First	off	Off	off	on
VCL Dome (VCLTP)	First	off	Off	on	off
Molynx (Visilynx)	First	off	Off	on	on
Baxall (ZTX3 / ZTX4)	First	off	On	off	off
Burle TC7400 AutoDome	First	off	On	off	on
Pelco Intercept "D" & "P"	First	off	On	on	off
Diamond SmartScan	First	off	On	on	on
Hitachi CD-08 / Mitsubishi CCD-300E Cameras	First	on	Off	off	off
JAI SV-2500	First	on	Off	off	on
Sensormatic RS422	First	on	Off	on	off
JVC TK-C675	First	on	Off	on	on
Ernitec ERNA protocol	First	on	On	off	off
Samsung SPP-12	First	on	On	off	on
Dennard	First	on	On	on	off
Mark Mercer	First	on	On	on	on
Plettac SVD106/SVD106A	Second	off	Off	off	off
Teljoy	Second	off	Off	off	on
AD Biphase	Second	off	Off	on	off
Gyyr Vortex	Second	off	off	on	on
Kowa Dome	Second	off	on	off	off
Mikami Dome	Second	off	on	off	on
Pacom	Second	off	on	on	off
Panasonic CS600 / CS650	Second	off	on	on	on
Vicon	Second	on	off	off	off

3.5. Auto Home Positioning

All PTZ units which support preset positioning, may take advantage of auto-homing when used in conjunction with the PIT. To use this feature, switch 1, positions 6 to 7 are used as follows:

Should an auto-home time-out value be set, then the PTZ will automatically be caused to return to preset position 1 after the expiration of the time-out. The time-out is calculated from the time the PTZ was last moved.

Auto Home Time-out	S1/7	S1/6
Auto-homing disabled	off	Off
15 seconds	off	on
1 minute	on	off
3 minutes 45 seconds	on	on

3.6. Write Protecting Home Position

The home position may be write protected by switching SW1/8 on. In this mode, it is not possible to modify preset position 1.

4. PTZ MODE DEVICE SPECIFIC OPERATION

4.1. Diagnostic Mode

In this mode of operation, every received PTZ control command is converted into a readable text string. This string is transmitted out of the PIT master communications port at 9600 baud, no parity, 8 data bits and 1 stop bit.

4.2. Betatech / GYYR CONTROLINK

In this mode of operation, the PIT generates output data which will control either the Betatech PTZC or the GYYR ControLink RD. This mode is used to convert from BossWare 9 bit mode, to 8 bit PC compatible mode, or to change the communication baud rate.

Note that the additional functions such as PTZ home positioning are NOT implemented in this mode.

Output Baud Rate	S1/6	S1/5
1200 baud	Off	Off
2400 baud	Off	On
9600 baud	On	Off
19.2 Kbaud	On	On

The output data may be in standard BossWare compatibe mode (9 bit data transmission) or 8 bit mode, which is more compatible with PCs

Output Data Format	S1/8
8 Bit PC compatible data	Off
9 Bit BossWare compatible data	On

4.3. VCL

The VCL auxiliaries for this dome have been assigned the following functions by the PIT:

Keyboard function	VCL Function
Aux 1	Operates the 180 degree turn function
Aux 2	Turns auto focus on
Aux 3	Recalls alarm preset position (high speed)
Aux 4	Saves alarm preset position

4.4. Molynx

When set for Molynx compatible protocol output, switch 1/5 is used to set fixed speed / variable speed control. When this switch is off, full variable speed control is allowed. When this switch is on, only fixed speed commands are transmitted to the Molynx telemetry receiver.

The auxiliary outputs are mapped to the Molynx telemetry receiver as follows:

Keyboard function	Molynx Function
Aux 1	Aux 1
Aux 2	Aux 2
Aux 3	Wash
Aux 4	Wipe
Aux 5	Lamps
Aux 6	Lens slow
Aux 7	Camera
Aux 8	Home

4.5. Baxall ZTX3 and ZTX4

The PIT generates data for this protocol at 1200 baud. Ensure that the telemetry receiver is set for this data rate. The first 8 preset positions are supported for receivers which support this function.

4.6. Burle TC7400 Series Dome

When in the Burle mode of operation, the output baud rate may be set by means of DIP switch S1/5

Master (Output) channel Baud Rate	S1/5
9600 Baud	Off
2400 Baud	On

4.7. Pelco 'D' and 'P'

In Pelco 'D" mode of operation, 255 addresses are supported. Setting DIP 1/8 on selects Pelco 'P' mode. In 'P' mode, the adjacent table shows the selection of the valid address range.

Address Range	S1/6	S1/5
Address 1 to 32	Off	Off
Address 33 to 64	Off	On
Address 65 to 96	On	Off
Address 97 to 128	On	On

4.8. Diamond "Fast Scan" / "Smart Scan"

When in the Diamond mode of operation, only 8 cameras may be controlled by a single PIT in broadcast mode. Selection of which group of 8 cameras may be carried out by means of DIP switch S1.

For any address outside of this range, a dedicated PIT per Diamond dome would be required.

Valid Addresses in Broadcast mode	S1/7	S1/6	S1/5
Address 1 to 8 inclusive	Off	Off	Off
Address 9 to 16 inclusive	Off	Off	On
Address 17 to 24 inclusive	Off	On	Off
Address 25 to 32 inclusive	Off	On	On
Address 33 to 40 inclusive	On	Off	Off
Address 41 to 48 inclusive	On	Off	On
Address 49 to 56 inclusive	On	On	Off
Address 57 to 64 inclusive	On	On	On

The auto home timeout for the diamond dome is as per the following table:

Various additional functions of the Diamond dome are supported by the operation of the auxiliary outputs:

Aux Output	Function
1 to 8	Operate dome aux output
9	Invvoke Smartscan Menu
10 to 19	Numeric '0' through '9'
20	Enter key
21	Escape key
22	Program Preset, Menu
23	Program Vectorscan, Menu
24	List Preshots
25	Run Vectorscan Once, Menu
26	Continuous Vectorscan, Menu

Aux Output	Function
27	Go to Preshot, Menu
28	Display On / Off
29	Coord Display On / Off
31 TO 40	Continous Vectorscan 1 to 10
41 TO 50	Vectorscan Once 1 to 10
51	Key 'E'
52	Key 'C'
53	Key 'D'
54	Key 'S'
55	Key 'N'

4.9. Hitachi CD-08 / Mitsubishi CCD-300E Cameras

Full functionality of zoom, focus, iris and preset positioning is supported when used in conjunction with the PIT. Obviously, as the camera does not incorporate a pan / tilt head, these functions are not available.

4.10. JAI CV-S2500 Camera

This camera does not support preset positioning and therefore the description in 3.5 and 3.6 is not applicable.

SW1/8 is used to prevent access to the camera configuration menu from the standard control keyboard. If this switch is in the off position, then the menu may be invoked by storing preset position 1. The up / down / left and right arrow keys then allow selection of various menu items. To leave the menu, store preset position 1 again. This switch being in the on position also limits the operator's access to certain functions as described below. The following table lists the keyboard functions:

Keyboard function	Jai Camera Function
Iris [C]	Selects AGC
Iris [O]	Selects manual gain control mode with maximum gain (255)
Aux 1	Selects AGC
Aux 2	Selects manual gain control mode with gain of 50
Aux 3	Selects manual gain control mode with gain of 100
Aux 4	Selects manual gain control mode with gain of 150
Aux 5 – AutoPan	Selects manual gain control mode with gain of 200
Aux 6 - PTZ F1	Switches off backlight compensation
Aux 7 - PTZ F2	Selects backlight compensation pattern 1
Aux 8 - PTZ F3	Selects backlight compensation pattern 1

Additional functions may be accessed by recalling preset positions as per the following table. These functions may also be accessed by operating the auxiliary output from the control system. Note that Aux 1 to 8 operate as described above.

Preset Number	Access controlled by S1/8	Aux Access	Jai Camera Function
1	No	n/a	Manual gain set to 0
2	No	n/a	Manual gain set to 50
3	No	n/a	Manual gain set to 100
4	No	n/a	Manual gain set to 150
5	No	n/a	Manual gain set to 200
6	No	n/a	Manual gain set to 255
7	No	n/a	AGC On
8	No	n/a	AGC fixed gain

The following functions are all accessible via auxiliary control commands:

Preset Number	Access controlled by S1/8	Jai Camera Function
9	No	AGC manual gain
10	No	Backlight compensation off
11	No	Backlight compensation pattern 1
12	No	Backlight compensation pattern 2
13	Yes	Auto shutter on
14	Yes	Flickerless shutter
15	Yes	Auto shutter off
16	Yes	Shutter speed 1/250
17	Yes	Shutter speed 1/500
18	Yes	Shutter speed 1/1000
19	Yes	Shutter speed 1/2000
20	Yes	Shutter speed 1/4000
21	Yes	Shutter speed 1/10000
22	Yes	Auto white balance
23	Yes	Manual white balance

Preset Number	Access controlled by S1/8	Jai Camera Function
24	Yes	One push white balance
25	Yes	One push white balance (as per JAI K/B)
26	Yes	White balance 3200K
27	Yes	White balance 4600K
28	Yes	White balance 5600K
29	Yes	Gamma 0.45
30	Yes	Gamma 0.60
30	Yes	Gamma 1.0
32	Yes	Negative image
33	Yes	Normal (positive) image
34	Yes	Down key
35	Yes	Up key
36	Yes	Left key
37	Yes	Right key
38	Yes	Menu toggle

4.11. Sensormatic RS422 Dome Protocol

Only 7 preset positions are currently supported by the PIT.

4.12. JVC TK-C675 Dome

When in the JVC mode of operation, only 99 cameras may be controlled by a single PIT in broadcast mode. Selection of which group of 99 cameras may be carried out by means of DIP switch S1/5

Note that as the dome address range is limited to 99, the PIT set to control domes in the range 101 to 199 modifies the address by subtracting 100. To control a JVC dome address 101, the dome must be set to address 1 and connected to the PIT with S1/5 ON.

The generated protocol may be optimised for the standard JVC protocol, or the extended model 'B' protocol, which allows for a greater range of variable speeds.

Turn on DIP S1/7 to enable auto-focus.

Valid Addresses in Broadcast mode	S1/5
Address 1 to 99 inclusive	Off
Address 101 to 199 inclusive	On

JVK Model	S1/6
TK-C675B	Off
TK-C675	On

4.13. Dennard RS422 Dome Protocol

The Dennard dome allows for the display of configuration menus. This feature may optionally be disabled using S1/5.

The menu may be accessed by using Aux 6 (Shown as PTZ F1 on the PCK). The accept function for this dome is "Recall preset position 1". A shortcut to accept is via Aux 8 (Shown as PTZ F3 on the PCK).

4.14. Plettac SVD106 / SVD106A

The Plettac dome allows for the display of configuration menus. This feature may optionally be disabled using S1/8.

Menu Access	S1/8
Access available	On
Access prohibited	Off

4.15. Gyyr Vortex

In this mode of operation, the PIT generates output data that will control the GYYR VORTEX DOME , set to the "Gyyr" protocol. Note that this is different to the GYYR Controlink protocol. Baud rates are set as per the following table.

Output Baud Rate	S1/6	S1/5
1200 baud	Off	Off
2400 baud	Off	On
9600 baud	On	Off
19.2 Kbaud	On	On

Note that the additional functions such as PTZ home positioning are NOT implemented in this mode.

The auxiliaries are mapped differently depending on the settings of S1/7 and S1/8.

Menu Function	S1/8	S1/7
Standard	Off	Off
Tour Define	Off	On
Menu Access	On	Off
Reserved	On	On

4.14.1 Standard Operation

In this mode auxiliary 1 to 8 operate the standard auxiliary functions of the Vortex dome. Certain auxiliaries are mapped to special functions as per the following table:

Standard Mode Aux Function	Aux
Tour 1	9 *
Tour 2	10 *
Tour 3	11 *
Menu Access	12
Menu keystroke	13 **

Note *: Set aux to 1 (on) to run tour. Set to 2 to end tour define. Set to 3 to start tour define.

Note **: Set the aux to the value of the keystroke which is required.

4.14.2 Tour Define Operation

Aux 1: start tour 1 define
Aux 2: end tour 1 define
Aux 3: start tour 2 define
Aux 4: end tour 2 define
Aux 5: start tour 3 define
Aux 6: end tour 3 define
Aux 7: start tour 1
Aux 8: end tour 2

4.14.3. Menu Access Operation

Aux 1: Menu access
Aux 2: Menu key up
Aux 3: Menu key stop
Aux 4: Menu key down
Aux 5: Menu key left
Aux 6: Menu key right
Aux 7: Menu key cancel
Aux 8: Menu key enter

4.16. Kowa Dome

Auxiliaries on the Kowa dome are mapped as per the following table:

If SW1/5 is on, then the PIT will generate 9 different speed settings, compatible with older Kowa domes. When this switch is on, then the PIT will generate 14 different speed settings, compatible with newer domes.

Kowa Dome Aux Function	Aux
Menu Access	1
Menu key up	3
Menu key down	4
Menu key left	5
Menu key right	6
Set Autopan Start	9
Set Autopan End	10
Start Autopan	11
Home position	12
Remote reset	13
Autoflip on / off	14

4.17. Mikami Dome|

Please note that the RS422 connection on this dome does not adhere to the standard. Connect as per the following table:

PIT RS422 Master port	Mikami Dome
TX[+]	B
TX[-]	A
GND	GND

The auxiliaries are mapped as per the following table

Mikami Dome Aux Function	Aux	Aux Value
Camera Manual	1	
Camera Auto	2	
EC 0	3	
EC 1	4	
Autopan (preset 63 to 64)	5	Autopan speed
Stop Autopan	6	
Auto EC	8	
Set shutter speed	9	0 : 1/60 s 1 : 1/100 s 2 : 1/500 s 3 : 1/1000 s
Set Gain	10	0 : 0 dB 1 : +6 dB 2 : +12 dB 3 : +18 dB
Set white balance	11	0 : Auto 1 : Indoor 2 : Outdoor 3 : One push trigger

4.18. Pacom Protocol

Address Range	S1/6	S1/5
Address 1 to 16	Off	Off
Address 17 to 32	Off	On
Address 33 to 48	On	Off
Address 49 to 64	On	On

Output Baud Rate	S1/8	S1/7
4800 baud	Off	Off
1200 baud	Off	On
2400 baud	On	Off
900 baud	On	On

Note that the address sent to the Pacom receiver always falls into the address range 0 to 15, which is set on the receiver. The above table specifies which range of addresses will be accepted by the PIT and mapped into the address range of the receiver.

4.19. Panasonic WV-CS600, CS650

This dome supports an address range from 1 to 96 only.

Please note that although the protocol is compliant with that provided by Panasonic, there is an issue with Preset position storage. It may be necessary to store a preset position more than once for it to be functional. On the first attempt, the dome will sometimes carry out a preset restore operation.

The function of the 8 aux keys are dependent on the setting of DIP S1/8.

Aux #	Function	S1/8
1	Preset Sequence Off	Off
2	Preset sequence on	Off
3	Autopan Off	Off
4	Autopan On	Off
5	One push focus	Off
6	N/a	Off
7	N/a	Off
8	N/a	Off

Aux #	Function	S1/8
1	Menu On	On
2	Menu Off	On
3	Menu Up	On
4	Menu Down	On
5	Menu Left	On
6	Menu Right	On

4.20. Vicon

The PIT generates data at 4800 baud. Set S1/8 for duplex if the Vicon telemetry is set for Duplex. The return data is not actually used and this setting affects the timing of the commands only. It is preferable to use simplex mode on the PIT and Vicon receivers / domes.

Certain auxiliaries are mapped as per the functions in the following table.

To access the menu of the Vicon Surveyor 99 dome, store preset number 94. The arrow keys, joystick, autopan (aux 5) and auto-iris (aux 7) keys may be used to navigate the menus.

Aux #	Function
5	Autopan
7	Auto Iris

5. DEVICE CONTROL INTERFACE

In this mode of operation, DIP switches 2 and 3 must be set up as shown in sections 3.1. through 3.3. DIP switch 1 is used to select the output protocol which is used to control the external device as per the following table:

Output / Transmitted Protocol Compatible With	S1/4	S1/3	S1/2	S1/1
Text / diagnosis output	off	Off	Off	off
ASCII string mode	On	On	On	On

Note that device operation may be achieved either by means of a serial message from a system controller, or from I^2C keyboard(/s) connected to the I^2C expansion port of the PIT. The I^2C expansion keyboard at address 3 maps to functions F1 to F16 and that at address 4 maps to functions F17 to F32.

5.7. ASCII String Output Mode

In this mode of operation, the actual text string which is to be sent to the device via the master channel is received on the slave channel. Sixteen functions have been defined (0x20 to 0x3f). DIP switch 1 positions 5 to 8, determine which function is received. The PIT will only respond to one of these functions, dependant on the settings of DIP 1.

The master port baud rate for ASCII string mode is set up by S3/6 and S3/5 as per the following table.

Master Port Baud Rate	S3/6	S3/5
1200 baud	Off	off
2400 baud	Off	on
9600 Kbaud	On	off
19.2 Kbaud	On	on

Valid Function Number	S1/8	S1/7	S1/6	S1/5
0x20	Off	Off	Off	Off
0x21	Off	Off	Off	On
0x22	Off	Off	On	Off
0x23	Off	Off	On	On
0x24	Off	On	Off	Off
0x25	Off	On	Off	On
0x26	Off	On	On	Off
0x27	Off	On	On	On
…				
0x2f	On	On	On	On

6. ALARM CONCENTRATOR

In this mode of operation, DIP switches 2 and 3 must be set up as shown in sections 3.1. through 3.3.

In ASCII / Text mode, all changes in the input state are transmitted out of the master communications port in ACSII at 8 data bits, no parity, 1 stop bit. Also all I^2C expansion inputs are copied to the I^2C expansion outputs.

Master Port Serial Mode	S1/2	S1/1
No Message Transmitted	Off	Off
ASCII / Text message transmitted	Off	On
BossWare Alarm message Transmitted	On	Off

In BossWare mode all alarm input information is transmitted out of the master port in BossWare format. This allows for another alarm concentrator to be connected via RS422 and it's (remote) outputs to mirror the (local) alarm input status. In this mode 2 PIT units may be connected "back to back", via RS422, with each PIT I^2C outputs reflecting the other PIT I^2C inputs.

Master Port Baud Rate	S1/4	S1/3
1200 baud	Off	off
9600 baud	Off	on
19.2 Kbaud	On	off
57.6 Kbaud	On	on

7. CONNECTIONS

7.1. Slave Port Configured as RS422

Control messages from the master control device, which generates the PTZ control information, are received on this port. The RS422 configuration allows for multiple PITs to be connected on a common communications line. Connections are as follows:

Pin Number	Pin Function
1	RS422 Receive data [-] (from BossWare master RS422 Tx[-])
2	RS422 Receive data [+] (from BossWare master RS422 Tx[+])
3	RS422 Transmit data [+] (to BossWare master RS422 Rx[+])
4	RS422 Transmit data [-] (to BossWare master RS422 Rx[-])
5	RS422 Communications common
6	n/c
7	n/c
8	n/c
9	n/c

Should it be required to operate the PIT in RS485 mode, then the TX pair and the RX pair must be joined together on this connector. i.e. Pin 1 to pin 4 and pin 2 to pin 3.

7.2. Slave Port Configured as RS232

Pin Number	Pin Function
1	Internally connected to pins 4 and 6
2	TXD (data to master / control device RXD)
3	RXD (data from master / control device TXD)
4	Internally connected to pins 1 and 6
5	GND
6	Internally connected to pins 4 and 6
7	CTS (from master / control device RTS)
8	RTS (to master / control device CTS)
9	n/c

7.3. Master Port Configured as RS422

Translated control messages, generated by the PIT, are transmitted on this port. The RS422 configuration allows for multiple PTZ receivers to be connected on a common communications line, should the PTZ receivers support unit addressing. Connections are as follows:

Pin Number	Pin Function
1	RS422 Transmit data [-] (to slave device RS422 Rx[-])
2	RS422 Transmit data [+] (to slave device RS422 Rx[+])
3	RS422 Receive data [+] (from slave device RS422 Tx[+])
4	RS422 Receive data [-] (from slave device RS422 Tx[-])
5	RS422 Communications common (from slave device communications common)
6	n/c
7	n/c
8	n/c
9	n/c

7.4. Master Port Configured as RS232

Pin Number	Pin Function
1	Internally connected to pins 4 and 6
2	TXD (data to slave device RXD)
3	RXD (data from slave device TXD)
4	Internally connected to pins 1 and 6
5	GND
6	Internally connected to pins 4 and 6
7	CTS (from slave device RTS)
8	RTS (to slave device CTS)
9	n/c

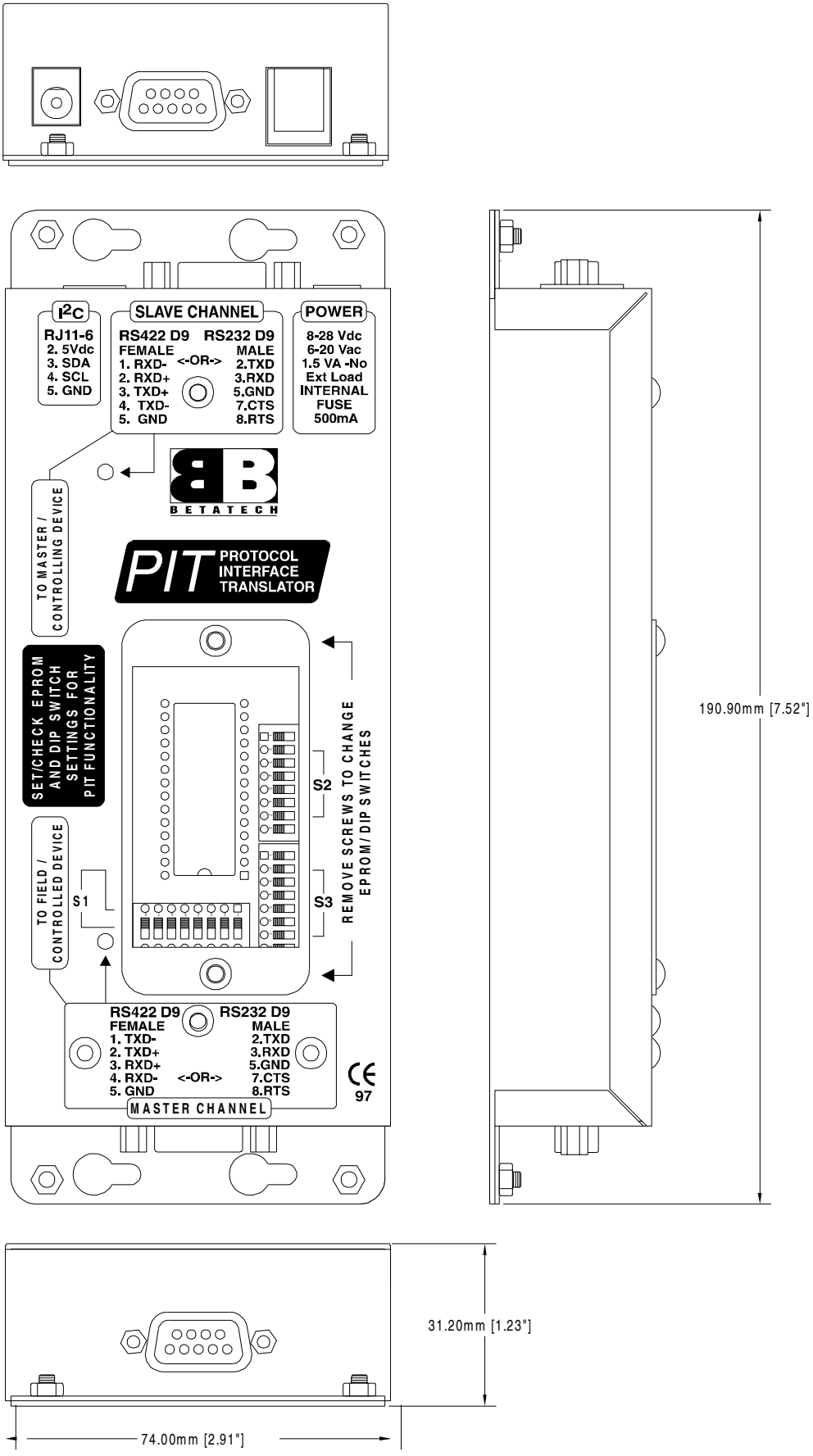
7.5. Power Connection

The unit is be powered by 7 to 25 VAC 50/60 Hz or 8 to 34VDC @ 1.5W. This is applied via the external power connector.

7.6. I^2C Expansion Connection

Pin Number	Pin Function
1	VCC (+ 5VDC out to external I^2C device)
2	SDA (I^2C data)
3	SCL (I^2C clock)
4	GND (Common)

8. MECHANICAL



9. SPECIFICATIONS

Compliance	EN55022 for radiated and conducted emissions IEC 801-3, Class 3 for RF susceptibility
Power Requirements	7 to 25 VAC 50/60 Hz or 8 to 34VDC @ 1.5W, requires external power adapter
Mechanical	Dimensions: 74mm (W) X 31.2 mm (H) X 190.9mm (D) Weight: 390g Finish: Brushed stainless steel
Environmental	Operating Temperature: -10 to +50 deg C Storage Temperature: -20 to +65 deg C Humidity: 0 to 95% RH (non-condensing)
Slave Communications Port	Baud Rate: 9600 Baud, 19.2 KBaud, 57.6 Kbaud or 115.2 Kbaud Addressing range: Broadcast or 1 to 255 Protocol: BossWare. Electrical: RS422, can be wired for RS485.
Master Communications Port	Baud Rate: From 1200 Baud to 57.6 Kbaud, dependent on required translation type. Electrical: RS422, can be wired for RS485. Optionally RS232.
Connector Type	RS232 D9 Male RS422 D9 Female Power 2.0mm DC plug I2C 6 position RJ45 (4 fitted)
PTZ Translation Options: NOTE: The transmitted data may be set to control certain functions of equipment from the listed manufacturers. No representation is made that the generated data conforms in every respect to that of the listed equipment manufacturer.	Diagnostic / text output VCL VCLTP protocol dome Molynx (Visylinx) Baxall ZTX3 and ZTX4 Burle TC7400 series dome (9600 or 2400 baud) Pelco Intercept “D” or “P” protocol Diamond SmartScan (Address 1 to 8, 9 to 16 or single address) Mitsubishi CCD-300E camera Computar CD-08 camera Sensormatic UltraDome (RS422 dome protocol) JVC TK-C675A or B Dome (Address 1 to 99 or 101 to 199) Ernitec ERNA Protocol Samsung SPP12 RS422 Protocol Dennard RS422 Protocol Mark Mercer RS422 Protocol Plettac SVD106 / SVD106A Dome Protocol American Dynamics Bi-Phase Protocol (Can control only 1 PTZ at a time) Teljoy / Provicom RS422 Protocol Gyyr Vortex Kowa Dome Mikami Dome Pacom 2005, 2017, 2018 Panasonic WV-CS600,CS650,CS850 Vicon RS422 telemetry receiver / Surveyor 99 dome
Functions	Pan, tilt, zoom, focus, iris, 64 position presets store and recall, auxiliary function control. Functions not available on selected translation target device are excluded.
Other	Switch selectable write protection of preset home position Auto homing selectable, off, 15 sec, 1 min or 3 min 45 Sec.
Device Control Options:	Diagnostic / text output Configurable ASCII text strings (when used in conjunction with VideoBloX matrix)
Device Control functions:	Either via serial commands or device at address 1 may have certain functions controlled via I^2C expansion keyboards.